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less extent, notes are produced as in a Jew's harp. The tones are, however, very faint, and are audible only at a short distance.

The use of this bow, known as 'kāwotōne panda,' is restricted to the medicine-men or shamans, and other persons are rarely allowed to see and never allowed to touch the instrument. The sacredness of this bow, the fact that it is used by the medicine-men only in communicating with and praying to the 'kukini' or spirits, and that its manufacture is accompanied by ceremonial observances, including the rubbing of the bow with human blood—all seem to point to the bow as being of native origin. The limited contact of these Indians with the negro, and the place held by the instrument in the religious life of the people, here as well as elsewhere in America, would seem to militate against the view that the musical bow is on this continent the result of acculturation.

ROLAND B. DIXON.

CURRENT NOTES ON PHYSIOGRAPHY.

THE YOSEMITE VALLEY.

A CAREFUL study of 'the Pleistocene Geology of the south central Sierra Nevada with especial reference to the origin of the Yosemite valley,' by H. W. Turner (*Proc. Cal. Acad. Sci.*, 3d ser., Geology, i, 1900, 261-321, 8 pl.) is of much interest, but still leaves this interesting problem without definite solution. The suggestion that the valley is a *graben* is discarded, yet direct proof or disproof of this view can be gained only when identifiable structures are found in the rocks of the valley floor and of the uplands, as has been done in the case of the Rhine *graben*. It is concluded that 'the canyons of the Sierra Nevada, like most other canyons the world over, were formed in the main by river erosion'; but it is suggested that after a rather extended glaciation of the Sierra highlands, narrow and deep canyons were cut in an interglacial epoch, and that ice streams of a second glacial epoch 'greatly modified the new-cut canyons of the interglacial epoch, and gave them, within the glaciated area, substantially their present form.' The contrast between the broad U-shaped section of the Yosemite and the sharp V-shape of the Merced canyon farther

west seems to favor this view. Moraines are found on the valley floor at six points, the westernmost being where the open valley ends and the V-canyon of the Merced begins; it is pointed out that the size of the moraines would be greater if their bases were not generally buried in river sands and silts.

Gannett, commenting on Turner's article, forcibly maintains the glacial origin of the Yosemite, appealing especially to its hanging lateral valleys in support of his opinion (*Geogr. Mag.*, XII., 1901, 86-87).

PATAGONIA.

THE geographical results of the Princeton expeditions to Patagonia are presented by Hatcher in most interesting form. ('Some geographic features of southern Patagonia, with a discussion of their origin,' *Nat. Geogr. Mag.*, xi, 1900, 41-55.) The eastern coast shows a line of sea cliffs, from 300 to 500 feet high, seldom broken except at river mouths where the few harbors are found. The strata in the cliffs are nearly horizontal, but by following them for long distances two marine formations separated by a continental formation are discovered, all being covered by 20 or 30 feet of unstratified boulders and clays, the great shingle formation, of glacial and aqueous origin. Vast plains stretch inland from the coast, subarid, bearing thin grass and scattered bushes; guanacos and rheas are found here in abundance. The plains are broken by escarpments, often several hundred feet high, trending north and south, and interpreted as sea cliffs formed during the latest emergence of the region. Recent lavas cover considerable areas in the central interior, forming scoriaceous plains of large extent, here and there dissected by canyons. Indeed, all these features are broken by the valleys of rivers coming from the back country. One of these valleys, that of San Julian, has at present no stream; its waters having been captured by a northern tributary of the Santa Cruz, 100 miles in from the coast. Numerous depressions holding small salt lakes are interpreted as remnants of an ancient valley system, now masked by deposits formed during the last submergence of the region. The district piedmont to the Andes is sheeted with morainic

drift, the most fertile part of the plains; water is here plenty in small lakes. The peculiar drainage system of the Andean region is explained chiefly by the Pliocene depression and elevation of a previously dissected mountain range. Glacial erosion is not especially considered as contributing to the present topography.

W. M. DAVIS.

ZOOLOGICAL NOTES.

DURING the past year, L. Camerano has published (in *Atti della R. Accademia delle Scienze di Torino*, Vol. XXXV., and *Arch. Ital. de Biol.*, Vol. XXXIII., fasc. 2) papers on the 'somatic coefficient.' These are based on a plea made by Andres that ichthyologists and others express the proportion of parts of the body not in relation to any other convenient organ, as is often done, but rather in thousandths of the total body length. Thus, if x is the proportion to be expressed, l is the observed dimension, and L is the total length of the body, in millimeters, then, $x = \frac{1,000}{L} l$. The factor $\frac{10,000}{L}$

is the somatic coefficient and is constant for all organs of the body. Camerano makes the suggestion that the number 360, being readily divisible by more integers, is preferable to 1,000 and he publishes a convenient table of values of $\frac{360}{L}$ for every quarter unit from 1 to 360. It is to be hoped, however, that those who express the dimension of organs in multiples of the somatic coefficient will not fail to give also the absolute lengths of the organs, as these are of no less importance.

C. B. D.

IN describing to the Zoological Society of London, on January 15th, the collection of fishes brought home from Lakes Tanganyika and Kivu by the Tanganyika exploring expedition, under the leadership of Mr. J. E. S. Moore, Mr. G. A. Boulenger pointed out that the study of this important collection did not modify the conclusions embodied in his first report published in 1898. The exploration of Lake Kivu had thrown no light on the origin of the Tanganyikan fauna; the smaller lake proved to be very thinly populated with fishes, which all belonged to widely distributed genera,

the species showing a mixture of Nile and Tanganyika elements, with two that might prove to be endemic. The list of the fishes from the two lakes comprised 91 species, 74 of which had been named by the author. The collection now described consisted of examples of 50 species, 26 of which were new to science, 2 being made the types of additional genera of the family *Cichlidæ*.

A BILL ESTABLISHING A NATIONAL OBSERVATORY.

WE are now able to publish the text of the bill introduced into the Senate by Mr. Morgan on January 21st. The provisions seem to be all that could be asked, and it is to be hoped that men of science will unite in urging its passage. Personal letters to members of Congress and resolutions adopted by societies and institutions and forwarded to the Committee on Naval Affairs are the most effective way to advocate the measure. The bill is intended 'to organize the National Observatory of the United States' and reads as follows:

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the United States Naval Observatory shall hereafter be known as the National Observatory of the United States, and shall be governed by a Director thereof, who shall report directly to, and be under the supervision of, the Secretary of the Navy.

SECTION 2, That the Director of the National Observatory shall be an eminent astronomer, appointed by the President, by and with the advice and consent of the Senate, at a salary of five thousand dollars per annum, and shall be selected from the astronomers of the National Academy of Sciences unless, in the judgment of the President, an American astronomer of higher scientific and executive qualifications shall be found.

SECTION 3, That the Secretary of the Navy may detail for duty as astronomers at the National Observatory such professors of mathematics and other officers of the Navy as he shall deem necessary in the interests of the public service; but on and after the